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Observations on *Melanoleuca*. Type studies – 3

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Abstract — The results of type studies on several taxa of the genus *Melanoleuca* are reported and discussed: *Melanoleuca substrictipes*, *M. polioleuca*, *M. alutaceopallens*, *M. permixta*, *M. wrightii*, *M. lapataiae,* and *M. lapataiae* var. *ochroleuca*. For the first two taxa a lectotype and a neotype are designated respectively.

Key words — taxonomy, *Tricholomatales*

Introduction

Type materials of sixteen critical *Melanoleuca* taxa have already been discussed in two previous publications (Fontenla & Para 2007, 2008). Fontenla & Para (2007) reported on *M. diverticulata* G. Moreno & Bon, *M. electropoda* Maire & Malençon, *M. kavinae* (Pilát & Veselý) Singer, *M. meridionalis* G. Moreno & Barrasa, *M. metrodii* Bon, *M. nigrescens* (Bres.) Bon, and *M. pseudobrevipes* Bon. Fontenla & Para (2008) discussed *Melanoleuca decembris* Métrod ex Bon, *Tricholoma humile* var. *bulbosum* Peck, *M. luteolosperma* (Britzelm.) Singer, *Clitocybe nobilis* Peck, *M. pseudopaedida* Bon, *M. decembris* var. *pseudorasilis* Bon, *M. subalpina* (Britzelm.) Bresinsky & Stangl, *M. subdura* (Banning & Peck) Murrill, and *M. tucumanensis* Singer.

In this paper we hope to shed new light on seven more taxonomically critical taxa and designate one lectotype and two neotypes to clarify relationships of the three taxa to their closest allies.

Materials & methods

Microscopical characters were examined using a Leitz Biomed optical microscope equipped with 100×, 500× and 1000× lenses; a stereomicroscope mod. MbC-10 was used to make thin sections. The pileipellis was sectioned from radial sections of the pileus margins, and the stipitipellis was sectioned from longitudinal sections of the medial third of the stipe. Sections were routinely revived in L4, stained in Phloxine B,

and tested for amyloidity in Melzer's. Micrographs were made using a Nikon Coolpix 4500 digital camera. Throughout all text, citations in quotes ("…") comes from the original protologues (even if incorrect), except that the en-dash (–) is substituted to separate data.

The systematic framework adopted follows Bon (1991) with some personal changes.

Taxonomy

Melanoleuca substrictipes Kühner, Bull. Soc. Linn. Lyon 47(1): 52. 1978. Fig. 1

Original diagnosis: *Pileus 25–105 mm latus, carnosulus, e convexo expansus, saepe obtuse umbonatus, jove pluvio albus vel eburneolo albus, sed mox albus, demum saepe alutaceus vel subisabellinus. Stipes 17–80 mm altus, 4–14 mm crassus, subaequalis, albus, glaber, apice subtiliter pruinosus, solidus vel farctus. Lamellae confertae, plus minusve sinuatae vel emarginatae, albidae. Odore spermatico. Sporae 8–10 × 5–6.5 µm, ellipsoideae, modice elongatae, asperulae. Cystidiae fusoideae-subcuspidatae, angustae, inferne 5–9 µm, superne 2–3 µm latae, septatae. In pascuis alpinis, frequens. Typus Herb. Kühner, n° 66-13.*

Specimen studied – "Herbier R. Kühner (G) – *Melanoleuca substrictipes* R. Kühner – F – Savoie – Parc Nat. de la Vanoise, environs de Pralognan – Entre le Pas de L'Ane et le Cirque des Nants – Alt.: 1900 – « K 66-13 » – Leg./Det. : R. Kühner – 20-07-1966" **lectotypus**, **hic designatus**. [G, Conservatoire et Jardin botaniques de la ville de Genève, GENEVA, Switzerland]. Revision date: 26 August 2008.

(Macrocharacters, see Kühner 1978: 46–49).

Microcharacters —Basidiospores 7.2–9.6 × 4.8–6.0 µm; av. = 8.60 × 5.55 µm; Q = 1.35–1.75; Qm = 1.55; ellipsoid, with small, dense, isolate and rounded warts, without a suprahilar plage. Basidia 31–33 × 7–8 µm, clavate, 4-spored. Cheilocystidia 45–55 × 6–8 µm, rare, urticiform, with a thin wall, hyaline, sometimes with incrusted apex. Pleurocystidia not seen. Stipitipellis made up of long, narrow hyphae, intermixed with shorter ones constricted at septa, with scattered short, clavate or cylindroid cells, not in clusters; caulocystidia not seen. Pileipellis a cutis of interwoven hyphae, without emergent elements, with a thin gelatinized suprapellis. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

Comments - The authentic material kept in Geneva (G) is subdivided into two portions. "Pr. 66-13" is composed of fragments of several pilei and stipes and is difficult to study; "66-13 lot B" consists of basidiomata sections, all in good state. Each part is accompanied by various barely legible hand-written notes, interpreted for us by Pierre Arthur Moreau: Envelope 66-13 (Fig. 1) — "*Melanoleuca* Pr.66-13 (Pr is for Pralognan, the name of the locality in the Vanoise National Park), 20 July 1966, 17 carpophores (remarquable qualité !) Odeur vite aigrelette bolétoïde." Envelope 66-13 lot B — "Melanoleuca Pr 66.13, lot B, 3 exemplaires. 20 July 1966. Sûrement pas spermatique en coupe!"

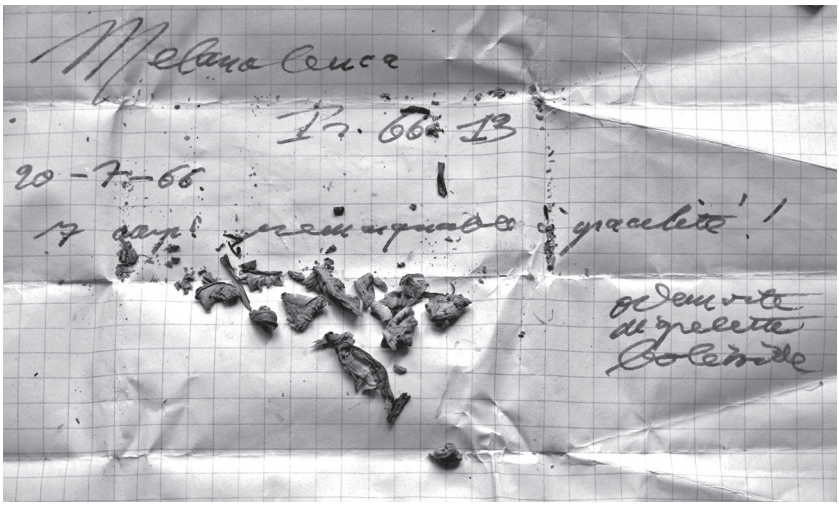

Figure 1. *Melanoleuca substrictipes*. 66-13 envelope (lectotypus).

However, it seems clear that the two parts represent two different collections made the same day – 20 July 1966 – and that Kühner decided to separate them due to differences in appearance and odor. In Pr. 66-13, we observed urticoid (fusoid) cystidia, as reported in the protologue, while in 66-13 "lot B", we noted numerous fusoid macrocystidia, very different from those in the Pr. 66–13 basidiomata.

The indication of the "aigrelette boletoide" odor for Pr. 66-13 matches the protologue description (Kühner 1978: 370), while the "lot B" spermatic odor ("sûrement pas spermatique") contradicts "souvent distinctement spermatique après la coupure" noted in the protologue.

Based on ICBN Arts. 9.9 and 9.12 (McNeill et al. 2006), we here designate the portion of the original material marked Pr. 66-13 as lectotype of *M. substrictipes*, since the protologue is also based on this material and it fits the protologue very well.

Melanoleuca favrei Bon is a closely related species with longer spores (Qm = 1.71, as confirmed by our type study).

Other similar European species are *M. substrictipes* var. *sarcophylla* Kühner and *M. pseudoevenosa* Bon ex Bon & G. Moreno, which have ochraceous gills at maturity and spore ratios of Qm = 1.56 and 1.72, respectively. Comparable extraeuropean species are *M. conspurcata* (Berk. & Broome) Pegler and *M. tropicalis* Pegler, which our type studies showed to have spore ratios of Qm = 1.48 and 1.65, respectively. We need more data to confirm whether these differences are taxonomically significant.

Melanoleuca alutaceopallens (P. Karst.) Konrad & Maubl., Icon. Select. Fung. 6(10): 324. 1937.

≡ *Tricholoma melaleucum var. alutaceopallens* P. Karst., Medd. Soc. F. Fl. Fenn. 9: 40. 1882.

≡ *Tricholoma melaleucum* subsp. *alutaceopallens* (P. Karst.) Sacc.., Syll. Fung. 5: 135. 1887.

≡ *Tricholoma alutaceopallens* (P. Karst.) P. Karst., Medd. Soc. F. Fl. Fenn. 16: 85. 1890 ("1889").

Original diagnosis: *Pileus carnosus, mollis, e convexo planus, obsolete umbonatus, laevis, glaber, alutaceopallens, vix hygrophanus, circ. 7 cm. latus. Stipes farctus, rigidofragilis, strictus, aequalis, basi incrassatus, primitus squamuloso-fibrillosus, glabrescens, apice pruinosus, albidus, demum nigrescens, 6–7 cm. longus, 4–5 mm. crassus. Lamellae emarginatae, planae, horizontales, rectae, lineares, sat angustae, admodum confertae, integerrimae, albae, 4–5 mm. latae. Caro alba, mollis, non hygrophana. In clivis sterilibus prope Mustiala, m. Sept. 1882.*

Specimen studied: "Museum Botanicum Universitatis, Helsinki (H) – Herbarium Petter Adolf Karsten (1834–1917) #5270 – (*Tricholoma*) n-sp. – *Tricholoma melaleucum* (Pers.) var. – FINLAND. Etelä-Häme (EH/Ta). Tammela. Mustiala – Grid 27° E: – [no date] – leg. & det. P.A. Karsten – (H6003411)", **neotypus, hic designatus** (H). Revision date: 7 February 2008.

(Macrocharacters, see Karsten 1882: 40).

Microcharacters – Basidiospores 7.8–10.8 × 4.8–6.2 µm; av. = 8.82 × 5.73 µm; Q = 1.25–2.00; Qm = 1.55; subglobose or subcylindrical, with small or medium, weakly amyloid warts, which are dense, isolate, rounded, rarely, with well-delimited suprahilar plage. Basidia 23–30 × 7–10 µm, clavate, 4–spored. Cheilocystidia numerous, macrocystidia type, 65–85 × 12–19 µm, lageniform or fusoid in shape, thin-walled, with crystals at apex. Pleurocystidia scarce, similar to cheilocystidia. Stipitipellis made up of hyphae up to 240 × 20 µm, without emergent elements or caulocystidia. Pileipellis made up by interwoven hyphae, with conspicuous yellow-tawny intracellular pigment. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

Comments – The type collection is composed of three entire basidiomata in good condition. No collection date is noted on the specimen envelope, but the locality, which is included, agrees with the original diagnosis ("prope Mustiala"). Karsten's envelope bears the herbarium number "5270", but the material is filed at H with the number H6003411. As we cannot assume that Karsten's original description is based on H6003411, it cannot be selected as a lectotype. However, given the lack of other material suitable for a lectotype selection, we think that the above collection can be designated as the neotype of *Tricholoma melaleucum* var. *alutaceopallens*.

This species is difficult to separate from other representatives of the same subgenus, which seem to differ mainly on macroscopical features that are lost in drying (pileus colour etc.): e.g., *M. melaleuca* (Pers.) Murrill, *M. cavipes* Métrod ex Bon, *M. pallidicutis* Bresinsky.

Karsten (1890) also described *Tricholoma alutaceopallens* var. *stercorarium,* which has not yet been transferred to *Melanoleuca* and which differs from the typical form (var. *alutaceopallens*) in darker pileus color and growth on dung.

Melanoleuca polioleuca (Fr.) Kühner & Maire, Bull. trimest. Soc. mycol. Fr. 50: 18 (1934).

≡ *Agaricus melaleucus* var. *polioleucus* Fr., Syst. Myc. 1: 115. 1821.

≡ *Agaricus polioleucus* (Fr.) Pass., Nuovo Giorn. Bot. Ital. 4: 58. 1872.

≡ *Tricholoma melaleucum* var. *polioleucum* (Fr.) Gillet, Les Hyménomycètes: 128. 1874.

≡ *Tricholoma melaleucum* subsp. *polioleucum* (Fr.) Sacc., Syll. Fung. 5: 134. 1887.

≡ *Tricholoma polioleucum* (Fr.) Lapl., Dict. Iconogr. Champ. Sup.: 339. 1894.

≡ *Melanoleuca vulgaris* var. *polioleuca* (Fr.) Konrad & Maubl., Icon. Select. Fung.6(10): 322. 1937.

≡ *Melanoleuca melaleuca* var. *polioleuca* (Fr.) J. Favre, Ergebn. wiss.Unters. schweiz. Nat. Parks 6(42): 441. 1960, comb. inval. (basionym lacking).

Original diagnosis: *A.* melaleucus γ. polioleucus, *pileo griseo-livido, lamellis sordide albis, stipite subfarcto brevi, apice albo-pruinato. Constanter utique ab α. diversus nec elegans; sed e solo locoque diverso ortum puto; plurima enim utrique specei communia. Stipes 2 unc. longus, 2–3 lin. crassus, æqualis, sat firmus. Pileus obtuse umbonatus. Lam. latæ. Accedit ad* A. oreinum, *ut* A. melaleuc. *ad* A. humilem. *In regionibus depressis, campestribus, locis graminosis. (Lund, Alnarp etc) Oct. Nov. (v.v.)*

Specimen studied: "Mus. Botan. Stockholm. – Fungi suecici – *Tricholoma polioleuca* – Småland: Femsjö s:n, Femsjö, Hägnen, Grytskedsängen, åker. – 4.8.48 – G. Haglund et Seth Lundell – (S) reg. nr. F70162", **neotypus, hic designatus** (S). Revision date: 1 October 2008.

(Macrocharacters, see Fries 1821: 115).

Microcharacters – Basidiospores 6.0–8.4 × 3.8–4.8 µm; av. = 7.24 × 4.66; Q = 1.30–1.88; Qm = 1.56; with small, dense, amyloid warts, which are isolate and rounded, more rarely elongated, with well-delimited suprahilar plage. Basidia 28–33 × 8.5–9.5 µm, clavate, 4-spored. Cheilocystidia 50–70 × 12–17 µm, frequent, mostly fusiform, thin-walled. Stipitipellis made up of long, narrow hyphae, with scattered, small clusters of short, clavate cells, intermixed with caulocystidia, which are similar to cheilocystidia. Pileipellis made up of a thick ixocutis. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

Comments – The type collection comprises four entire basidiomata in good condition. These specimens were collected in the same place where Fries used to collect and its micromorphological features match those proposed by nearly all authors as characterizing the taxon "*polioleucus*" (see Métrod 1949, Singer & Clémençon 1972, Bresinsky & Stangl 1977, Kühner 1978, Enderle & Krieglsteiner 1987, Bon 1991, Gulden 1992, Moreno et al. 1994, Lonati 1998, Watling & Turnbull 1998, Boekhout 1999, Grilli & Lanzoni 1999, Fontenla et al. 2001, Munzmay 2005, Caroti et al. 2006, Vesterholt 2008). Therefore, since

there is no original material available, this collection is here proposed as the neotype of *Agaricus melaleucus* var. *polioleucus*.

Melanoleuca melaleuca has white flesh, a non-pruinose stipe, and usually grows in the forests; *M. subpulverulenta* (Pers.) Singer has lageniform cystidia, a grey pileus, and grows in the forests; *M. heterocystidiosa* (Bon & Beller) Bon has grey pileus and fusiform or lageniform cystidia; *M. polioleuca* f. *langei* Boekhout differs from the typical form only in the relatively short stipe; *M. polioleuca* f. *pusilla* Boekhout & Kuyper is smaller and grows in grassland; and *M. polioleuca* var. *confusa* G. Moreno has pale stipe flesh and grows under coniferous trees.

Neotypes should be designated for the last two taxa, as their holotypes are believed to be missing (personal communication by L and AH herbaria curators).

Melanoleuca permixta Raithelh., Hong. Argentin. 1: 139. 1974. Fig. 2

Original diagnosis: *Pileo sordidae pallido, centro fusco, convexo-umbonato, glabro, 4–5 cm lato. Odore grato, sapore miti. Lamellis cremeis, sinuatis(-adnatis), subdistantibus. Stipite pallido, cavo, 4–5 cm/6–8 mm, carne pallida. Sporis in cumulo candidis, amyloides, subverrucosis, 7.5–9/4.5–6 my. Cheilocystidiis nullis. Pratis, autumno.*

Typus: Veronica/Prov. Buenos Aires nùmero MeA-10472 in herb. mihi conservatur.

Specimen studied: "*M. permixta*, nr. 104-72", holotype (Z+ZT). Revision date: 3 September 2008.

(Macrocharacters, see Raithelhuber 1974: 139).

Microcharacters – Basidiospores 8.2–9.8 × 5.0–6.2 µm; av. = 8.58 × 5.77 µm; Q = 1.35–1.78; Qm = 1.49; with thick, dense, isolate, amyloid warts, rounded or more rarely elongated in shape, with well-delimited suprahilar plage. Basidia 28–31 × 7–8 µm, clavate, 4-spored or 2-spored. Cheilocystidia 37–55 × 7–10 µm, frequent, urticoid (fusoid-shaped), thin-walled, often with crystals at the apex. Pleurocystidia similar to cheilocystidia, frequent, especially in the sinus of lamellae. Stipitipellis made up of long, narrow hyphae, with numerous clusters of short, clavate or cylindraceous cells. caulocystidia not seen. Pileipellis made up of interwoven hyphae, with some ascending but not emergent elements. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

Comments – The type collection is composed of two-thirds of a basidiome in good condition. In the protologue *Melanoleuca permixta* is described as an acystidiate species, but we found urticoid cystidia in the original material studied (Fig. 2), which would place this species in subgenus *Urticocystis*. This species is close to *M. exscissa* (Fr.) Singer owing to its colours and microscopic features, but the lack of further collections does not allow us to evaluate the variability of such features or to propose synonymy.

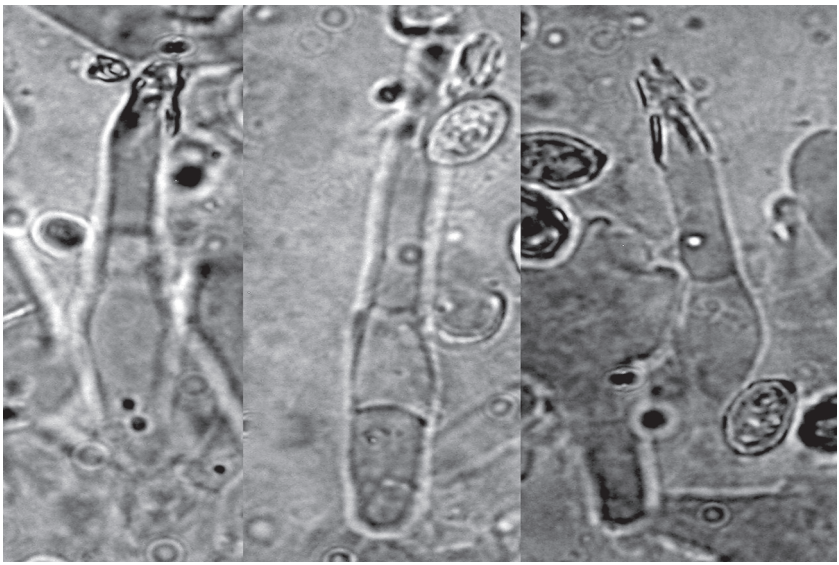

Figure 2. *Melanoleuca permixta.* Cystidia.

Melanoleuca wrightii Raithelh., Metrodiana 2(4): XXVII. 1971. Fig. 3

Original diagnosis: *Pileo pallide griseo, centro suboscuriore, convexo depressove, gibboso, flexuoso, subviscoso, deinde nitente, 5–6.5 cm lato. Carne albida. Odore subingrato, sapore miti. Lamellis cremeis vel pallide griseis, basi clarioribus, 6–8 mm latis, adnatis vel dente decurrentibus, medio distantibus. Stipite cremeo, sursum suboscuriore; subfibrilloso, farcto, 2–3 cm longo, 5–7 mm lato. Sporis amyloideis, in cumulo albis, 8.5–11/6–6.5 my, subasperis. Ap.* Fraxinum *in hortis; autumno.*

Typus: Palermo/Buenos Aires. Sub numero MeA-3470 in herb. mihi conserv.

Specimen studied: "*M. wrightii*, nr. 3470", holotype (Z+ZT). Revision date: 3 September 2008.

(Macrocharacters, see Raithelhuber 1971: XXVII).

Microcharacters – Basidiospores 7.4–9.6 × 4.8–6.2 µm; av. = 8.68 × 5.68 µm; Q = 1.20–1.80; Qm = 1.53; with thick, dense, isolate, amyloid warts, rounded or rarely elongated in shape, with well-delimited suprahilar plage. Basidia 33–38 × 8–9 µm, clavate, 4-spored or 2-spored. Cheilocystidia 35–50 × 8–10 µm, numerous, urticoid (typical in shape), thin-walled and with incrustated apex. Pleurocystidia very rare, similar to cheilocystidia. Stipitipellis with scattered, large clusters of short, clavate cells, intermixed with frequent urticoid (fusoid-shape) caulocystidia, 30–45 × 7–8 µm. Pileipellis made up of a trichoderm of ascendant cylindrical hyphae bearing apex-rounded terminal elements. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

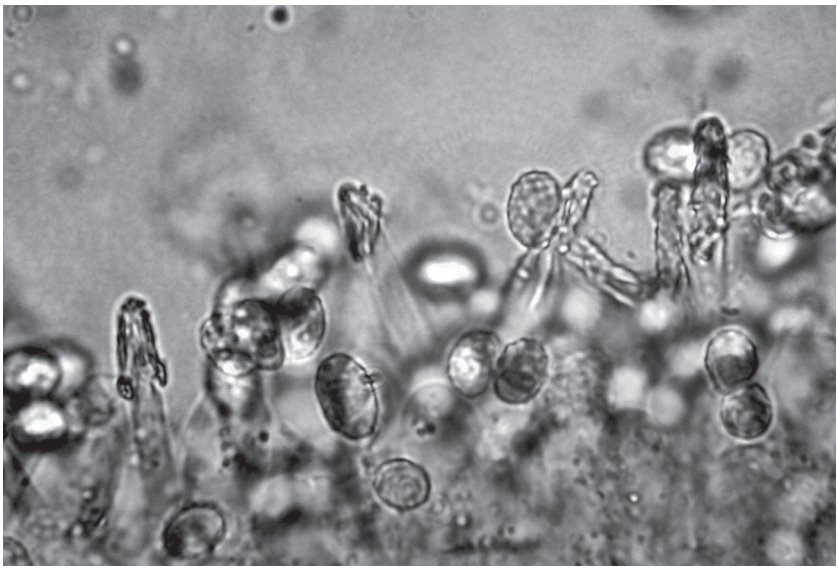

Figure 3. *Melanoleuca wrightii.* Cystidia.

Comments – The type collection consists of one entire basidiome and one single pileus without stipe, all in good condition.

In the protologue the author does not record the presence of cystidia, but the original material exhibits typical cystidia (Fig. 3); accordingly, we place *M. wrightii* in subgenus *Urticocystis*. Like *M. permixta*, this species is close to *M. exscissa*, but the lack of further collections does not allow to estimate the variability of such features and to propose the synonymy.

Melanoleuca lapataiae Raithelh., Metrodiana 2(4): XXVI. 1971. Fig. 4

Original diagnosis: *Pileo lilacino-griseo vel albido cum centro pallide lilacino-griseo, interdum maculoso, margine clariore, ± gibboso, convexo, deinde depresso, glabro, vel partim nitido vel leviter tomentoso, interdum subsquamuloso; carne albida, sub cuticula ± lilacina-grisea. – 3–5 cm lato. Odore nullo, sapore miti. Lamellis albidis, nunc adnatis nunc dente decurrentibus nunc subliberis, saepe basi coniunctis. Stipite albido, interdum leviter grisaceo, primo farcto, adulto cavo, crustato, superficie leviter fibrilloso, rarior basi subbulboso, 3–4 cm longo, 4–10 mm lato; carne albida. Sporis amyloideis, in cumulo albidis vel candidis, asperis, 7–8.5/4.5–5.5 µm, ovoideis. Cheilocystidiis fibulisque nullis. Pascuis, partim cum Nothof. dombeyo.*

Typus: Lapataia/Argentina prope Hosteria Alakush. Sub numero MeA-271 in herb. mihi conserv.

Specimen studied: "*M. lapataiae – Nr. 271*", holotype (Z+ZT). Revision date: 19 August 2008.

(Macrocharacters, see Raithelhuber 1971: xxvi–xxvii).

Figure 4. *Melanoleuca lapataiae*. Cystidia.

Microcharacters – Basidiospores 8.2–10.8 × 4.8–6 μm; av. = 9.48 × 5.79 μm; Q = 1.36–2.05; Qm = 1.64; with small, dense, isolate, rounded amyloid warts, with poorly developed but obvious suprahilar plage. Basidia 43–52 × 10–12 μm, clavate-elongate, 4-spored. Cheilocystidia 43–65 × 7–8 μm, abundant, macrocystidia type, fusoid, many of them bearing a septum, thin-walled, and with an encrusted apex. Pleurocystidia present but less numerous than cheilocystidia, even if very similar in size and shape. Stipitipellis made up of long, narrow hyphae, with frequent cylindrical cells, isolate or in clusters. caulocystidia not seen. Pileipellis made up of a trichoderm of ascendant hyphae with rounded and/or strangled terminal elements. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

Comments – The type collection includes two entire basidiomata in good condition. Raithelhuber did not record the presence of cystidia for this species, either in the protologue (Raithelhuber 1971) or in two subsequent papers citing this agaric (Raithelhuber 1972, 1987). However, in a later description (Raithelhuber 1993), he wrote: "Cheilo (and pleuro?) cystidia 40–55/5–7 μm, fusiform, with thin wall."

These contradictions have so far made it impossible refer *M. lapataiae* to a subgenus. Study of the holotype (Z+ZT) allowed us to ascertain that *M. lapataiae* exhibits very unusually shaped cystidia (Fig. 4), which make it difficult to assign to any of the currently accepted cystidial types for *Melanoleuca*. We have never seen such cystidia in any of the very numerous collections of *Melanoleuca* we have examined. Due to its peculiar size and shape — always fusoid and mostly

septate — *M. lapataiae* takes an intermediate position between the subgenera *Urticocystis* and *Melanoleuca*. Only further studies, especially those based on a molecular approach, will provide further data on its taxonomic treatment.

Melanoleuca lapataiae var. ***ochroleuca*** Raithelh., Metrodiana Sonderheft 1: 16. 1972.

Original diagnosis: *Differt M. lapataiae pileo albo-ochraceo vel cremeo, umbo ± ochraceo, basi stipiti subaurantio-croceo in adultis et sporis 6.5–7.5 × 3.2–5 my.*

Typus: Lapataia, ripo Lago Rocae, sub numero MeA-371 in herb. mihi conserv.

Specimen studied: "*M. lapataiae* var. *ochroleuca, nr. 3-71*", holotype (Z+ZT). Revision date: 19 August 2008.

(Macrocharacters, see Raithelhuber 1972: 16).

Microcharacters – Basidiospores 8.4–10.8 × 5.0–6.0 µm; av. = 9.21 × 5.67 µm; Q = 1.44–1.90; Qm = 1.63; with small to medium, dense, isolate, rounded, amyloid warts, with poorly developed but obvious suprahilar plage. Basidia 31–36 × 5–8 µm, clavate, 4-spored or 2-spored. Cheilocystidia 40–65 × 8–11 µm, not very frequent, macrocystidia type, fusoid, partially septate (in approximately 50% of cases), sometimes with encrusted apex, thin-walled, hyaline. Pleurocystidia very rare, similar to cheilocystidia. Stipitipellis made up of long, narrow hyphae, with frequent cylindrical cells, isolate or in clusters, caulocystidia not seen. Pileipellis made up of a cutis of interwoven hyphae, with some scattered, rising but not emerging elements. Dermatocystidia and thromboplerous hyphae absent. Clamp connections absent.

Comments – The type collection is composed of an almost entire pileus and the stipe apex, all in good condition. The basidiospore size recorded in the original diagnosis is wrong, according to a personal communication by J. Raithelhuber, who states that the correct size is "10–11 × 5–7.5 µm," which was confirmed by our study of the original material.

Melanolecua lapataiae var. *ochroleuca* showed us the same micromorphology as that of *M. lapataiae* var. *lapataiae*, except for the different pileipellis structure. We think that it is correct to regard these as two taxa separated by differences in the pileipellis structure and colors of the pileus and stipe base. The peculiar cystidial morphology of these varieties prevents placement in any of the currently named subgenera and suggests erection of a new subgenus; however, because it was not possible to obtain comparable molecular sequences from the two specimens due to age, we prefer to wait for collection of fresh material before suggesting taxonomic changes.

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Anderberg, curator at S; Tuomo Niemelä, curator at H; Reinhard Berndt, curator at Z+ZT for providing us with the material requested. Our most sincere thanks are due to Pierre Arthur Moreau and Fernando Esteve Raventós for their pre-submission reviews. Edmondo Grilli is thanked for improvements in the English text.

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